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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,543	12/12/2003	Chang-Dong Feng	R290.12-0029	2721

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Christopher R. Christenson
Westman, Champlin & Kelly
Suite 1600
900 Second Avenue South
Minneapolis, MN 55402-3319

EXAMINER	
DEB, ANJAN K	

ART UNIT	PAPER NUMBER
2858	

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,543	FENG ET AL.	
	Examiner	Art Unit	
	Anjan K. Deb	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2,4-8, are rejected under 35 U.S.C. 102(b) as being anticipated by Jewell (US 5,367,911).

Re claims 1, Jewell discloses flow through conductivity sensor comprising flow conduit 126 (Fig. 10), first 122 and second 124 electrodes disposed relative to the flow conduit to contact process fluid proximate the conduit, current return conductor 134 (Fig. 10) coupled to first 122 and second 124 electrodes, and toroid 132 (transformer) arranged to interact with current return conductor 134 to provide an indication (output signal from line 136) of process fluid conductance (column 9 lines 56-68, column 10 lines 1-10).

Re claims 2, 4, 5 Jewell discloses at least one toroid is configured as a transformer 132 having a pair of windings disposed about the current return conductor 134 and one winding is connected in series with the return conductor 134 (Fig. 10).

Re claims 6, 8 Jewell disclose first and second electrodes formed by contact ring (circumferential electrodes)(column 8 lines 1-4).

Re claim 7, Jewell discloses second electrode includes a conductive process pipe (casing lining a borehole)(column 9 lines 57-60).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3, 9-14, 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell (US 5,367,911) in view of Rosenthal (US 3,404,336).

Re claim 3, 10-12, 14, 16, 17 Jewell disclosed one toroid 132 (detect or receive toroid) and did not expressly disclose a second toroid (drive toroid) for generating a current in the fluid. Re claims 16, 17 Jewell disclosed all of the claimed limitations except means for generating a current in the fluid.

Rosenthal discloses an apparatus (Fig. 1) and method for measuring electrical conductivity of a fluid comprising a second drive toroid (16) driven by oscillator (OSC) for inducing current (*i*) in a fluid in conduit 13 (column 2 lines 1-27).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jewell by adding a second drive toroid disclosed by Rosenthal for setting up a current in a fluid in the conduit for measuring the conductivity of the fluid as a function of the current induced in the fluid.

Re claims 9, 22 Jewell disclosed first 122 and second 124 electrodes includes a metal pipe (Fig. 10) disposed between a pair of insulating pipes (column 9 lines 57-60), but did not expressly disclose each insulating pipe includes insulating ends and an insulating liner, but would have been obvious for providing the required electrical insulation between the two electrodes 122,124.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jewell by adding pair of insulating pipes each insulating pipe having insulating ends and an insulating liner for achieving the required level of electrical insulation between a current sensing electrode and guard electrode as disclosed by Jewell.

Re claim 13, Jewell disclosed measuring current on output line of toroid but did not expressly disclose measuring the impedance of a toroid coupled to current return path.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jewell by measuring the impedance across toroid coil instead of measuring the current for measuring fluid conductivity since output current depends upon the impedance.

Re claims 18-20, Jewell disclosed means for measuring includes a toroid configured as a transformer 132 including the two electrodes 122, 124 (Fig. 10).

Re claim 21, Jewell disclosed a first and second electrode is a contact ring (circumferential electrodes)(column 8 lines 1-4).

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell (US 5,367,911) and Rosenthal (US 3,404,336), in view of Newman (US 4,100,491).

Re claim 15, Jewell combined with Rosenthal did not expressly disclose selecting a measurement regime using an electrical switch. However, a selection switch is routinely used in a test environment for range selection as required for measuring or controlling a test variable.

Newman (US 4,100,491) discloses method of detecting conductivity (metal particles) in a flowing fluid, comprising electrical switch 62 for selecting a measurement regime (selecting voltage bias level applied to drive coil) for controlling the level of input voltage applied to drive coil (Fig. 3).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jewell by adding an electrical switch disclosed by Newman for selecting a measurement regime (range) for selecting voltage bias level applied to drive coil for controlling the level of input voltage applied to drive coil.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Anthony (US 3,387,209) discloses method and apparatus for measuring conductivity (the metal oxide content of liquid metal) in a fluid flow conduit comprising toroids and selection switch for generating and measuring the level of current induced in the fluid.

Fleury (US 3,980,946) discloses method and apparatus for measuring the electrical conductivity of a liquid comprising means for generating and measuring the level of current induced in the liquid by induction coils.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lefkowitz Edwards can be reached at 571-272-2180.

Anjan K. Deb
Patent Examiner
Art Unit: 2858
3/4/05

Tel: 571-272-2228
Fax: 571-273-2228
E-mail : anjan.deb@uspto.gov